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The Public Health Worker in Conservation of Vision for Old Age*

A. L. Chapman, M.D.

U. S. Public Health Service, Washington, D. C.

POINTS out how public health workers can absorb into their programs various aspects of sight conservation, and how the work of voluntary agencies may best be utilized.

MUCH can be done by public health workers to further the cause of sight conservation. It is essential that public health resources be mobilized to assist the campaign now being waged by voluntary agencies to eliminate the causes of blindness and loss of sight and to cooperate in the rehabilitation of those whose sight has been impaired.

Whether health officers and their staffs can be enlisted in the sight conservation movement will depend, to a great extent, upon their attitude towards it. If the philosophy prevails that sight conservation is not a reasonable public health activity, the voluntary agencies will have to continue to "go it alone." On the other hand, if public health administrators accept the newer concept of public health, there is little doubt that our health department staffs can and will do effective work in finding persons whose sight is impaired or those who are in danger of losing it.

New Concept of Public Health

What is this newer concept of public health? Briefly, it proposes that the health department staffs should supplement the work of physicians in the total care of patients with chronic diseases and

* Presented at the Fortieth Anniversary Conference of the National Society for the Prevention of Blindness, New York City, March 16–18, 1949.

physical impairments and cooperate with other community agencies in seeing that all available preventive and remedial resources are utilized effectively.

Just what does this imply? Does it mean conflict with the medical profession? The answer to that question is no! It means that health departments can supplement the work of physicians by screening out persons who have a high index of suspicion for any disease. These persons can be referred to their own physician for the establishment of a diagnosis, for an adequate physical and mental appraisal, and for treatment. These screening activities can bring patients to the doctor's office when a disease is in its early stages and when its progress can be more readily checked. This means much greater satisfaction both to the doctor and to the patient.

Early discovery is the crux of the chronic disease problem. At the present time, when purely preventive measures are still in the experimental stages, it also means the provision of vastly improved and expanded follow-up services. Treatment regimes prescribed by physicians for persons suffering from chronic diseases are usually prolonged ones, and are difficult for the patient and the family to carry out. The prescription of proper diets, the use of potent drugs, the adherence to exercise schedules—all tax the intelligence of even well educated patients. The physicians themselves do not have the time to spend hours patiently instructing patients in the details of home care. It is essential, therefore, that such supplementary services be made available by health departments, acting in close cooperation with physicians. From this it may be seen that nurses, nutritionists, and health educators all have much to contribute to the home care of patients with chronic diseases.

Another phase of this new concept of public health is education of the patient. Such education can be done by the public health nurse in the home, by the health educator through the usual educational channels, or by the health officer himself. The benefits of group dynamics can be obtained by bringing together, for instruction, groups of patients who are all afflicted with the same disease. The practicing physicians can furnish or approve the substance of the material that is taught and may even be used as the class instructors. The result of such efforts to educate the patient concerning the nature of his disease will be better patient cooperation

in adhering to prescribed treatment schedules, a more faithful kind of reporting to the physician, and a more dramatic response to treatment.

It is fairly obvious that the application of these principles will result in the finding of cases of chronic disease and the inauguration of proper treatment at an earlier stage than would be possible without the active cooperation of our health departments.

Health Department Responsibility for Sight Conservation

What has all this got to do with sight conservation? Simply this—the principles involved in the provision of sight conservation services by health departments are the same as those which are designed to control the chronic diseases.

Of course, there are exceptions to this. Some elements of a sight conservation program have long been accepted as public health responsibilities. The prevention of ophthalmia neonatorum, for instance, results largely from the control of gonorrhea, which is, of course, a communicable disease. The prevention of congenital syphilis, of smallpox, and of meningitis—all of which affect the eyes—are old-line health department activities. Despite these few exceptions, health departments have largely neglected the overwhelming amount of work that must be started in the field of sight conservation.

The number of local health departments engaged in comprehensive accident prevention programs which tend to reduce the toll of blindness is small. How many health departments take an active interest in screening programs designed to find children with errors of refraction? How many are interested in correcting the conditions that are found? How many health departments cooperate with the National Society for the Prevention of Blindness and local prevention of blindness organizations in educating the public concerning sight conservation? How many sponsor glaucoma clinics, conduct in-service training courses for their staffs, or attempt to determine the extent of the sight loss problem in their own communities?

I think that all will agree that relatively few health departments are now conducting such programs. On the other hand, it should not be difficult for most health departments to set up a satisfactory

sight conservation program. The example of other public health disease control programs provides a well-established pattern to follow.

Developing Control Program for Sight Conservation

Experience in developing control programs in the past has resulted in the crystallization of a definite plan of action which consists essentially of four steps: (1) determining extent of the problem; (2) establishing epidemiology of diseases causing loss of sight; (3) setting up pilot studies; and (4) promotion of sight conservation programs throughout the country.

Determining the Extent of the Problem.—Efforts have already been made to determine the extent of the problem in the field of sight conservation. Some concrete knowledge exists concerning the number of blind people in the United States, the number of children born blind or with congenital eye defects, and some intelligent estimates have been made concerning the number of people with such disabilities as glaucoma and cataract.

As valuable as this information is to the public health administrator interested in expanding sight conservation activities, it must be supplemented by information gleaned locally. Some statistics are more readily available than others. Better reports concerning the prevalence of those communicable diseases that are implicated in loss of sight can be obtained. The incidence of congenital eye defects should not be hard to determine. In addition, valuable information can be obtained from school authorities who are responsible for screening for eye defects among school children; from public health nurses who have been trained to look for eye defects and blindness in the members of the families they visit; and from private physicians.

Establishing Epidemiology.—The second step is to establish the epidemiology of those diseases which cause blindness and loss of sight. Our knowledge of the epidemiology of gonorrhea and syphilis is far more extensive than our knowledge of the epidemiology of cataracts and glaucoma. To determine the epidemiology of cataracts, glaucoma, myopia, and such an obscure condition as retrolental fibroplasia, research efforts must be intensified. There are still too many questions about eye diseases for which no satisfactory

answers have been found. Until we know these answers we will have to be content with finding cases early and insuring prompt and adequate treatment.

Setting Up Pilot Studies.—The third step in the evolution of a control program consists of setting up pilot studies in which control methods based on our present knowledge may be put to the acid test of actual field trial. Pilot studies lessen the possibility of recommending impractical control programs to the nation. They afford a valuable arena in which to apply on a test basis hypothetical control operations developed in research experiences. If a control method is found to be too costly or proves ineffective in a demonstration area, the loss in time and money is small. Better methods may still be tried. If a control method stands up in actual practice in a demonstration area, it can be recommended for more extensive application with some degree of assurance that it will work.

Demonstration programs may be of various types or directed toward various objectives. In one community a screening program for glaucoma may be developed because of the interest and cooperation of local ophthalmologists and the health officer. In another community, a statistical study may be conducted to find out the best and most economical methods of collecting data concerning the prevalence of visual defects. A demonstration in health education methods may constitute the local approach in a third area. It is even conceivable that sufficient enthusiasm and interest may be generated in some communities to support several activities of this sort. The end result would be the evolution of complete community sight conservation programs that would put into effect all of the knowledge that now exists concerning sight conservation.

Promotion of Sight Conservation Programs.—The fourth and final step is the promotion of sight conservation programs in every community throughout the country. This entails in-service training of staffs and the training of new recruits, the provision of consultation services to state and local health departments, education of the medical profession and the lay public, the expansion of physical facilities, and, most important of all, the appropriation of sizeable sums of money by federal, state and local authorities. Nor should the need for planning by the medical profession be forgotten. No sight conservation program of any worth-while size can be con-

sidered without the active cooperation of the medical profession, particularly the ophthalmologists.

Fortunately, the National Society for the Prevention of Blindness has had extensive experience in working with the medical profession, and can be of great assistance to health departments if and when they enter the sight conservation field on a large scale.

While on the subject of doctors, I think it would be helpful to re-emphasize the supplemental nature of the proposed health department activities. Whether or not there is a shortage of physicians is a debatable subject. Sometimes these debates become quite heated. However, I believe it can be said safely that most physicians today are busy. If some of the less vital services which they now provide could be offered by nonmedical personnel, I am sure the doctors would welcome the additional time thus made available to them to devote to their patients. Moreover, in those areas where there is an undisputed shortage of physicians, physicians now active could serve more patients with beneficial results.

Another fundamental administrative principle that would be as pertinent to a sight conservation program as it would be to a heart disease or cancer control program is the principle that presently employed health department personnel be used wherever possible. There are already too many full-time workers engaged in specialized public health programs. The possibility of using generalized public health nurses to follow up eye cases should be thoroughly explored before any decision is made to employ specialized nurses. Health educators can add sight conservation information to their regular armamentarium. Nutritionists can be oriented to the possibilities of improving sight by bettering nutrition. It will be impractical to employ many specialized public health workers in order to inaugurate sight conservation programs in our local health departments. Ophthalmologists, however, might be employed on a consultant or part-time basis.

This principle applies particularly to sight conservation programs because of the diversity of the causes of blindness and visual impairments. A sight conservation program has its roots in the communicable disease, mental health, industrial hygiene, maternal and child health, chronic disease, school health, nutrition, and even the environmental sanitation programs of health departments.

Workers in the sight conservation field, who have spent a lifetime in developing community services designed to prevent blindness, occasionally have been disappointed by the apparent slowness with which their programs have progressed. Perhaps this is fortunate. It may be beneficial that the full development and the integration with other health department functions of the sight conservation program have awaited the coming of age of our chronic disease programs.

Chronic Disease Program and Sight Conservation

As the spotlight of public attention is played on our aging population and on the increased prevalence of degenerative diseases, an opportunity will be offered to point out to better advantage the increasing incidence of glaucoma and cataracts, as well as the need for doing something about them. Just as there is a time to operate for cataracts, so there is a time to promote actively a public health program. The present time seems particularly suited to begin planning an expanded sight conservation program.

There are many reasons why conservation of vision is important in a chronic disease program. There is not sufficient space to enumerate these reasons in detail, but I will mention several in passing.

Sight Conservation and Old Age

The success of our economic system depends upon the productivity of workers. Yet modern education has consistently postponed the time when an individual begins to produce. As a result it is becoming increasingly important to extend the productivity of workers in the older age group. Since blindness and defective vision seriously interfere with the productivity of workers, it is only common sense to prevent or control the development of these conditions by whatever means possible.

The success of other public health programs during the past thirty years has resulted in a well-recognized shift in the age composition of our population. Each year the number of old people in the population is growing. It is inevitable, therefore, that the incidence of glaucoma, cataracts, and other pathological eye conditions will increase. The need for preventive and ameliorative sight

conservation services will keep pace with this aging of our population.

From a humane standpoint, sight conservation programs also can be justified. Retirement after a busy and productive life can be a pleasant experience if the retired individual has full access to books, and plays, and visual delights of nature. Let blindness or faulty vision intervene and retirement becomes nothing more than a frustrating and bitter anti-climax to a too often drab life.

Conclusion

Thanks to the pioneering efforts of the National Society for the Prevention of Blindness and its co-workers, much is known about the causes of blindness and sight loss. There is much that is still unknown. The time is ripe for our federal, state and local public health agencies to ally themselves actively with the National Society, seek the appropriation of suitable funds, recruit and train personnel, delineate the local problems, roll up their sleeves, and go to work.

Causes of Blindness in Illinois

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PRESENTS findings of study of 6,881 applicants for blind assistance in Illinois, and compares them with federal studies.

IN 1943 the General Assembly of Illinois enacted the laws which brought the present Blind Assistance program into operation. Financing of this program was through state appropriations for which matching amounts were provided under the Federal Social Security Act. The Illinois Public Aid Commission was made responsible for the administration of blind assistance and on October 1, 1943, the first assistance payments to needy blind persons were received. An advisory committee on ophthalmology was appointed to advise on the medical methods of procedure, the treatment program, and standards of visual eligibility for blind assistance applicants.

This Committee proposed that the definition of economic blindness suggested by the Social Security Board and approved by the House of Delegates of the American Medical Association in June, 1934, be adopted.* When experience with the definition revealed that persons with severely handicapping field defects were being excluded, this Committee recommended a more equitable definition of economic blindness which the Commission adopted in December, 1945.†

* "In terms of ophthalmic measurement, central visual acuity of 20/200 or less in the better seeing eye with correcting lenses is considered economic blindness. A field defect in which the peripheral field has contracted to such an extent that the widest diameter subtends an angular distance of no more than 20 degrees may be considered equally disabling."

† "In terms of ophthalmic measurement, central visual acuity of 20/200 or less in the better eye with correcting lenses is considered economic blindness. A peripheral field loss in which the visual field efficiency is reduced to 30 per cent or less, may be considered equally disabling, as may certain ocular conditions which do not necessarily involve central visual acuity or peripheral field loss but which constitutes a severe visual handicap."

The Committee recommended that all examinations for blind assistance applicants be conducted by ophthalmologists certified by the American Board of Ophthalmology except in areas where such examiners were not available, and reviewed qualifications of all physicians appointed to act as examiners. It also suggested the adoption of an appropriate and complete ophthalmological medical record.

It was also recommended that all blind pension recipients who applied for blind assistance be re-examined to determine visual eligibility. (Those applicants in Cook County who had been re-examined in the years 1941 to 1943 by competent certified ophthalmologists were exempted from this requirement.)

A supervising ophthalmologist was appointed, and the Committee suggested the following as his duties:

1. To determine from the submitted eye examination report the visual eligibility of each applicant;

2. To develop and activate a treatment program in the interests of restoration or preservation of vision;

3. To refer to the proper agencies for vocational rehabilitation or adjustment services those hopelessly blind recipients who by virtue of age, physical condition, and mental attributes were deemed amenable to such training;

4. To classify and arrange for transposition of the essential medical and social information to a mechanical tabulating system in order to conduct research into the causes of blindness and the dependency that is often the sequel to such a handicap.

Scope of the Study

The statistical information contained in this report pertains to 6,881 applicants found visually eligible for blind assistance. All were examined during the period October 1, 1943, through March 31, 1947, with the exception of those recipients in Cook County previously mentioned.

The causes of blindness and the anatomical site and pattern of the diseases producing blindness have been grouped according to the principles set forth for use of the *Standard Classification of the*

*Causes of Blindness.** There were many cases in which it was difficult to establish the definite etiological factor causing blindness, so that it was necessary to explore the past medical history by contacting individual ophthalmologists or clinics who had seen the applicant in the incipiency of his ophthalmic illness. By means of a rather voluminous correspondence it was possible to determine the original pathological process in a large number of these questionable cases. When the cause of blindness was given as trauma a detailed supplemental history was sought. Through these efforts many possibilities were explored to assure the statistical honesty and accuracy of this study.

Due to the fact that it was not possible in many cases to determine the date of the onset of blindness or to learn which eye was the last to become blind, both eyes were classified. (The recommended procedure has been to classify only the blinding eye.) Comparison of the data for the right and left eyes demonstrated that there was no significant variation in the causes of blindness for either eye. This report therefore pertains to the etiology of and topographical site in the cases of blindness in 13,762 eyes.

The Etiological Classification of Causes of Blindness

It was possible to classify definitely the primary etiological factor in 7,038 or 51 per cent of the 13,762 eyes. In addition, in 4,243 or 31 per cent of the eyes the causative factor was "unknown to science." The bulk of the latter group consisted of eyes blinded because of primary glaucoma, senile cataract, or myopia. The etiological factor in 2,481 eyes, or 17.9 per cent of the total, could not be determined by the examiner or by investigative methods. This latter group was composed mostly of cases of so many years' duration that the etiological factor could not be discovered by further investigation and included about 225 eyes that had been removed surgically many years prior to their blind assistance applications.

In the eyes where the cause of blindness was definitely determined, infectious diseases had the highest incidence, being responsible for 21.2 per cent of the blindness found in 13,762 eyes. Of

* Developed by the Committee on Statistics of the Blind of the American Foundation for the Blind and the National Society for the Prevention of Blindness.

the infectious diseases syphilis and trachoma were the greatest offenders as they were found responsible for blindness in 7.4 and 7.3 per cent, respectively, of all the eyes. Ophthalmia neonatorum, specific or otherwise, was responsible for blindness in 286 eyes, or 2.3 per cent of the total. Other infectious diseases causing blindness, in a relatively small percentage of eyes and in the order named, were septicemia, meningitis, measles, tuberculosis, typhoid fever, and scarlet fever.

Prenatal diseases, either hereditary or congenital (excluding prenatal syphilis), accounted for blindness in 10.4 per cent, or 1,426 eyes. The disease was of prenatal origin without specified cause in 6.5 per cent of the 13,762 eyes. In 1.6 per cent the hereditary origin could be definitely established, and in 2.3 per cent the hereditary origin was presumed because of the nature of the disease process. In this group it was interesting to note that the incidence of blindness due to hereditary or congenital causes, excepting syphilis, was almost twice as great in the Caucasian race as in the Negro.

Injuries, including chemical burns, accounted for blindness in 1,282 eyes or 9.2 per cent of the total. Approximately one half of the traumas were associated with non-occupational activities, one fourth with industrial accidents, and a similar number with unspecified types of activities. These figures might not apply to the general population since many individuals, blinded as a result of industrial accidents, have received financial compensation for their injuries and would not appear in a study of blind assistance recipients. Of the non-occupational injuries, most accidents were associated with play, sports activities, traffic accidents, or malicious injuries.

General systemic non-infectious diseases caused blindness in 1,233 eyes, representing 9 per cent of the total. In this group the principal diseases producing blindness were in the order named: vascular and cerebro-vascular lesions, diabetes, diseases of the central nervous system, and anemia or other blood diseases. Other non-infectious systemic diseases such as nephritis, complications of pregnancy and childbirth, and nutritional deficiencies were the causes of blindness in a small percentage of eyes. These conditions and a group of cases in which the general disease was not specified accounted for blindness of 278 eyes.

Neoplasms accounted for loss of sight in 126 eyes and poisonings in 53 eyes.

TABLE 1. ETIOLOGICAL CLASSIFICATION OF BLINDNESS OF RECIPIENTS OF BLIND ASSISTANCE

Etiological Classification	*Eyes*			
	Number		*Per Cent*	
TOTAL		**13,762**		**100.0**
Unknown to Science		**4,243**		**31.0**
Undetermined or Not Specified		**2,481**		**17.9**
Infectious Diseases		**2,918**		**21.2**
Syphilis	1,021		7.4	
Trachoma	1,003		7.3	
Ophthalmia Neonatorum	286		2.3	
Other	608		4.2	
Diseases of Prenatal Origin		**1,426**		**10.4**
Heredity Established	222		1.6	
Heredity Presumed	318		2.3	
Prenatal Cause not Specified	886		6.5	
Trauma (Including Chemical Burns)		**1,282**		**9.2**
Non-occupational Trauma	651		4.7	
Occupational Trauma	294		2.1	
Trauma not Specified	337		2.4	
Non-infectious Diseases		**1,233**		**9.0**
Vascular or Cerebro-vascular Lesions	428		3.1	
Diabetes	324		2.3	
Central Nervous System Diseases	151		1.1	
Anemia or other Blood Diseases	52		0.3	
Other	278		2.2	
Neoplasms		**126**		**0.9**
Poisonings		**53**		**0.4**

Topographic Site of Blindness

Approximately one fourth (25.6 per cent) of all blindness involved the eyeball in general. The chief affection of this kind was primary glaucoma which accounted for the visual depreciation in

1,960 eyes or 14.2 per cent of the total number. Etiologically this group was classified as "unknown to science." Myopia (or its sequela) was present in 593 eyes of which only 41 were attributable to prenatal influences or causes. Structural anomalies and degenerative changes of the eyeball were each the locale of blindness in less than 2 per cent of the total cases. Other conditions such as acute endophthalmitis and panophthalmitis accounted for blindness of less than 1 per cent of the eyes.

The optic nerve was affected in 2,238 eyes or 16.3 per cent of the total. Primary optic atrophy was present in 1,709 eyes or 12 per cent. About half of these atrophies were definitely attributable to syphilis. Retrobulbar and intracranial lesions were present in 344 eyes or 2.5 per cent of the total. In a minor number of cases optic neuritis, neuroretinitis, or choked disc was the disease process.

In 2,148 eyes, or 15.6 per cent of the total number, the primary visual loss was attributable to disturbances of the crystalline lens. Cataract was the particular type of disturbance, with the exception of 81 eyes, in which the lens was dislocated. Although the etiology of most cataracts is unknown to science, 15 per cent were reported to be prenatal in origin and 7 per cent were due to general diseases.

Affections of the cornea produced blindness in 2,138 eyes or 15.5 per cent of the total. Infectious diseases were the causative factor in 65 per cent of this group, trachoma being the chief offender. Corneal blindness was due to trauma in 260 eyes, and the remaining number of corneal disturbances were mostly of undetermined origin.

The choroid and retina were affected in 1,892 or 13.7 per cent of the eyes. Retinal degeneration and chorioretinitis were the principal pathological changes found. Vascular diseases, diabetes, and conditions of prenatal origin were the most important of the known etiological causes of affections of these tissues. Retinitis pigmentosa was present in 419 eyes, but in only one third of this number could the hereditary origin of the disease be definitely established.

Diseases of the iris and ciliary body were responsible for blindness in 931 eyes or 6.8 per cent of the total. Syphilis, septicemia (acute or chronic), and injuries were the principal known sources of affections in this area. Of the 931 eyes in this group, sympathetic

ophthalmia was given as the disease process in 158 eyes, or approximately 15 per cent of all the diseases of the iris and ciliary body producing blindness.

The miscellaneous and ill-defined group consists of 867 eyes in which it was impossible to ascertain the exact area that had been primarily involved. There were 417 eyes in which the diagnosis was equivocal because of the presence of a cataract with other inferred posterior segment or optic tract pathology.

TABLE 2. TOPOGRAPHICAL CLASSIFICATION OF BLINDNESS OF RECIPIENTS OF BLIND ASSISTANCE

Topographical Classification	*Eyes*			
	Number		*Per Cent*	
TOTAL		**13,762**		**100.0**
Eyeball in General		**3,525**		**25.6**
Glaucoma	1,960		14.2	
Myopia	593		4.3	
Structural Anomalies	258		1.9	
Degenerative Changes	241		1.7	
Other	473		3.5	
Optic Nerve		**2,238**		**16.3**
Primary Atrophy	1,709		12.0	
Retrobulbar and Intracranial Lesions	344		2.5	
Other	185		1.8	
Crystalline Lens		**2,148**		**15.6**
Cataract	2,067		15.0	
Dislocated Lens	81		0.6	
Cornea		**2,138**		**15.5**
Choroid and Retina		**1,892**		**13.7**
Iris and Ciliary Body		**931**		**6.8**
Sympathetic Ophthalmia	158		1.1	
Other	773		5.7	
Miscellaneous and Ill Defined		**890**		**6.5**

Comparison with Other Studies

Shortly after the statistical tabulation of our findings, the Federal Security Agency's Bureau of Public Assistance published a report

combining studies of the causes of blindness in 20 states. This report represented almost 21,000 blind assistance recipients who were geographically well distributed throughout the United States. The 20 studies by the state agencies were made in the period between November 30, 1940, and December 31, 1941. The Illinois study includes all visually eligible applicants for the period between October 1, 1943, and March 31, 1947. Although the individual state percentage of any given topographical or etiological diagnosis varied greatly, the average over-all percentage was so remarkably parallel to the Illinois findings that a comparison has been incorporated in this report. The Illinois study is made from examinations of more recent date and, in addition, the number of economically blind individuals studied is almost three times the number in any one state represented in the Federal report. In view of the wide individual variation found in the 20 states reporting, the statistical similarity of the Illinois and Federal reports is noteworthy. At first glance, it is rather surprising that the incidence of trachoma is practically the same, since southern Illinois has always been considered a part of the "trachoma belt" and as particularly plagued by blindness due to this cause. The Federal report includes six of the ten states which are in the trachoma belt as well as South Dakota where the high incidence of 35 per cent was found in a total of 265 cases studied.

The studies from these seven states, where the incidence of trachoma ranges from 5.4 per cent to 35 per cent, contains 1,551 or 7.5 per cent of the total 20,951 blind assistance cases studied. Because of the proportion of trachoma belt states represented, the figures in the combined report cannot be interpreted to mean that there is such a high incidence of trachoma throughout the United States.

Social Characteristics of Blind Assistance Recipients in Illinois

Since the loss of vision is usually not the sole factor operating to cause dependency, some of the significant social traits of the group have also been classified. The social characteristics of the Illinois group studied in this report can be briefly summarized.

Race.—In the Illinois study the relative ratio of blind Caucasians to blind Negroes was 83:17, while in the Federal study the ratio of

Caucasian to Negro blind was 78:21. The relationship of this ratio to the relative concentrations of the two races in the general population is difficult to evaluate since these studies were made subsequent to the last general census and it is quite obvious that the mass migrations of populations and races that have taken place since the war make the 1940 census figures doubtful.

TABLE 3. COMPARISON OF ETIOLOGICAL CAUSES OF BLINDNESS IN ILLINOIS AND IN 20 STATES REPRESENTED IN THE FEDERAL REPORT

Etiology	*Illinois (Per Cent)*	*U. S. Average Federal Report (Per Cent)*	*Variation in Incidence in 20 States Studied (U. S.) (Per Cent)*
Unknown Etiology	**48.9**	**49.9**	
Unknown to Science	31.0	28.6	16.7 to 44.2
Undetermined	17.9	21.3	6.6 to 39.4
Infectious Diseases	**21.2**	**24.6**	**10.5 to 47.2**
Syphilis	7.4	7.7	1.3 to 15.0
Trachoma	7.3	7.5	0.3 to 35.1
Ophthalmia Neonatorum	2.3	2.1	0.4 to 7.6
Other	4.2	7.3	— —
Prenatal	**10.4**	**9.5**	**5.1 to 18.2**
Trauma	**9.2**	**10.1**	**5.2 to 18.0**
General Diseases	**9.0**	**4.8**	**2.0 to 7.9**
Neoplasms	**0.9**	**0.6**	**0.1 to 3.0**
Poisonings	**0.4**	**0.5**	**0.1 to 1.5**

Age.—Both the Illinois and the Federal study indicate that economic blindness is predominantly a handicap of old age. In Illinois 46.4 per cent of the blind assistance recipients were 65 years or older, while the Federal study reports only 31.5 per cent as being 65 or over.* The composite report and this study were almost in agreement on the proportion of cases under 40 and those over 50, the figures being respectively 10 and 11 per cent under 40,

* The percentages in these studies are higher than actual facts would disclose because the young blind were included in the Illinois assistance program for only two years of the period covered by the study.

TABLE 4. COMPARISON OF TOPOGRAPHICAL CAUSES OF BLINDNESS IN ILLINOIS AND IN 20 STATES REPRESENTED IN THE FEDERAL REPORT

Topographical Site of Blindness	*Illinois (Per Cent)*	*U. S. Average Federal Report (Per Cent)*	*Variation in Incidence in 20 States Studied (U. S.) (Per Cent)*
Eyeball in General	**25.6**	**22.8**	— —
Glaucoma	14.2	10.5	3.4 to 15.0
Myopia	4.3	3.4	0.4 to 8.5
Structural Anomalies	1.9	2.0	1.0 to 3.3
Degenerative Changes	1.7	3.9	0.2 to 10.7
Other	3.5	3.0	— —
Optic Nerve	**16.3**	**16.8**	— —
Primary Atrophy	12.0	14.8	6.9 to 21.2
Crystalline Lens	**15.6**	**19.7**	**7.6 to 30.8**
Cornea	**15.5**	**17.8**	**8.1 to 40.8**
Choroid and Retina	**13.7**	**12.8**	**7.1 to 18.5**
Iris and Ciliary Body	**6.8**	**7.7**	**1.5 to 13.3**

and 77.5 and 69 per cent over 50. The 20 states reported only 101 persons under 20 years of age as receiving blind assistance while there were 43 such cases in the Illinois study. These figures only emphasize further the relationship of old age, blindness, and dependency.

Degree of Blindness.—The incidence of the various degrees of visual loss in Illinois and in the composite findings of 20 states is tabulated below:

	Illinois (Per Cent)	*Federal Study 20 States (Per Cent)*
Total Blindness	31	30.2
Light Perception Only	.24	25.9
Light Perception to 10/200	40	28.7
10/200 to 20/200	4	13.4
Eligibility on basis of restricted field or other causes	1	1.8

Sex.—Of the 6,881 Illinois recipients, 3,662 or 53.2 per cent were males and 3,219 or 46.8 per cent were females. The number of male recipients represented 9.3 per 10,000 general male population in Illinois in 1940. The comparable figure for females was 8.2. In the Federal study, 62.2 per cent were males, and 37.8 per cent females.

Restoration of Vision

One of the Illinois Public Aid Commission's objectives in the public assistance programs is to relieve the causes of dependency. A program designed to make medical and surgical care available to those who need and want treatment was therefore put in operation early in 1944. Specific recommendation for medical or surgical care in the interest of visual restoration or conservation was made in 844, or 12 per cent of the 6,881 recipients examined.

In 557, or 66 per cent of the 884 cases, lens extractions were recommended. In 101 of the 884 cases there was a good visual prognosis. In 743, the prognosis was either guarded or the procedure was recommended for visual conservation purposes. Due to age, physical and mental infirmities, religious convictions, fear, etc., 718 of these persons refused surgery. However, 166 of the 884 consented to surgery.

Of the 166 operated cases, 52 recipients remained eligible for blind assistance after surgery. All but 4 of the latter group of recipients had lens extraction in one or both eyes. Eighteen of the 52 cases received material visual benefit while 23 retained essentially the same vision. Six were classified as having a visual loss as a result of these surgical endeavors; however, only one of these had any appreciable loss of vision (9/200 to light perception).

Of the 166 operated cases, 114 regained sufficient vision to be considered no longer visually eligible for assistance and therefore not economically blind. All but 7 of these had lens extractions. Because of age and infirmities, 18 of the 114 applied for and received old age pension after regaining their vision. The remaining 96, or almost 60 per cent of the total operated, regained an employable status as far as vision is concerned. The exact final post-operative vision was unknown in 21 of the 114 operated cases; 30 cases had visual improvement to the levels of 20/100 to 20/50; and 62 cases had 20/50 or better post-operative vision.

Corneal Disease Remediable by Transplant

The examination reports of 1,069 recipients who were blind because of corneal diseases were reviewed to determine the number for whom corneal transplant surgery could be recommended from an ophthalmic standpoint alone and without regard to other factors, such as age or physical condition. It is believed that such a study has never been made to substantiate the oft repeated statement that 10,000 to 15,000 of the total estimated 250,000 blind population of the United States could be visually rehabilitated by means of corneal transplant surgery. In the selection of cases the following standards were used:

1. The blindness was determined to originate solely from corneal disturbances with freedom from other significant intraocular pathology and from ocular hypertension.

2. The cases selected were limited to those showing minimal vascularization with some area of the cornea being relatively clear and free of severe pathological changes.

3. Cases with specific corneal contra-indications such as an epithelial dystrophy were excluded.

Of the 1,059 records reviewed, only 43 fulfilled the above requirements and could be said to have a fair to good visual prognosis with corneal transplantation surgery. These figures indicate that the estimate of the incidence of corneal blindness amenable to corneal transplant surgery should be revised downward rather sharply. Projection of these figures would indicate that perhaps 1,500 individuals of the estimated quarter million blind persons in this country could be visually helped by this surgical procedure. If age and physical factors entered into the equation, the number would be decimated.

Conclusions

It is impossible to estimate the saving which has resulted to the state in carrying out this program. In the original Cook County survey 10 to 15 per cent of the recipients of blind pension under the county program were found to be visually ineligible on re-examination. Under the state program when applicants for blind assistance were examined, a large number of former blind pension

recipients were found to be visually ineligible. The total figures on visual ineligibility are not known as some blind pensioners who applied for blind assistance were not examined because they were found to be financially ineligible. In September, 1943, 6,790 individuals were receiving blind assistance throughout the state. In April, 1947, there were 4,899 recipients, a decrease of 27.8 per cent. Some of the decrease was due to factors such as a weeding out of the visually and financially ineligible, deaths, and employment. However, it is pertinent to point out that the greatest reduction in the number of individuals receiving blind assistance occurred as a result of the change in administration which was completed by June 30, 1944.

Summary

This program may be briefly summarized, as follows:

1. The causes of blindness have been carefully tabulated according to etiology and topographical sites from the records of recent competent ophthalmic examinations. The facts obtained reiterate and re-emphasize the major unsolved problems of blindness and redirect our attention to the problems of prevention of blindness. It is clear that primary glaucoma remains the greatest single source of blindness among all eye diseases in which restoration of visual loss is not possible. Until the problem of the etiology and pathogenesis of glaucoma is clarified, the watchword should be early detection and adequate medical supervision with frequent and regular follow-up care, if those so afflicted are to be prevented from becoming blind and perhaps economically dependent. Infectious diseases, traumatic injuries, and poisonings, representing approximately 31 per cent of the causes of blindness, are definitely preventable. Certainly the incidence of blindness attributable to general medical diseases could be reduced with proper and adequate care. The problem of the prevention of blindness due to prenatal influences is vast and difficult, but at least the surface has been scratched with the recent elucidation of the relationship of maternal rubella to congenital ocular defects. In addition, it is possible that the majority of the 12 per cent who were found to have remediable ocular conditions would have accepted surgical care if a good treatment program and

competent ophthalmic advice had been available at the time of their original application for blind pension.

2. By the transference of the essential and pertinent information concerning blindness to a mechanical tabulating system, it will be possible in the future to evaluate periodically the success or failure of efforts to prevent blindness.

3. As a result of the standardization of visual eligibility for blind assistance and the placement of the program under competent medical guidance, the visually ineligible persons, constituting probably 10 to 15 per cent of the total case load, have been weeded out.

4. A small percentage of recipients have as a result of surgical care been visually rehabilitated. The number of blind assistance recipients in Illinois who can be aided visually by corneal transplantation surgery is very small.

5. An indefinite but probably considerable financial saving in the administration of blind assistance has accrued and will continue to accrue to the state as a result of this program.

The Navy Eye Protection - Eye Correction Program*

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DESCRIBES Navy's provisions for insuring eye safety and eye efficiency for employees of its shore establishments.

AN appraisal of the results that have been achieved in accident prevention work in the past indicates that the present accident waste is wholly needless. This waste, a serious continuing drain on our national resources of human value, can be eliminated by the application of techniques designed to win the battle against human nature. An important phase of this is "man maintenance."

Personnel of the Navy are required to maintain their ships, guns, airplanes and tools in perfect shape, ready for use at any instant. In addition, the Navy endeavors to and does keep its personnel in perfect health so that they may be in condition to operate the ships, guns, and airplanes. In other words, the Navy has unison between "man maintenance" and machine maintenance.

In industry and in private life we have stressed machine maintenance more than man maintenance. When we purchase a new automobile, we wash, polish, and lubricate the car at regular intervals. As the car attains age and mileage, we have a tendency to overlook details and become more careless about the condition of the vehicle. Similarly, we may become complacent with our accident prevention program. If we are to achieve the desired results in accident prevention, we must give more consideration to the man by forming a union between man and machine and taking the

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necessary steps to protect the man. There are many ways to accomplish this but among the most important is protecting man with modern and proper eye protective equipment.

Eye Protection

The most widely used item of eye protective equipment is the goggle. In the selection of this equipment, careful consideration must be given to the degree of protection afforded, job efficiency permitted, and the personal comfort allowed. Too much protection for the job, with the worker overburdened by equipment, is no more effective than too little. It would be unwise to require a worker to wear a bulky mask or face shield when a lightweight spectacle would serve the purpose.

There is another phase to be considered when providing eye protection to workers, and that is obtaining the optimum degree of efficiency from the worker. To accomplish this end it is necessary to provide, so to speak, the right eyes for the job. If a worker can perform his duties in comfort, better production will be obtained along with good morale; and, in addition, eye injuries will be reduced.

The increased use of eye protective devices in industry during the war years produced evidence that eye injuries could be controlled. This was demonstrated in our naval shipyards as well as in all shipbuilding industry—after an initial bad experience, eye injuries were reduced about 75 per cent by the use of the proper eye protective devices. During this time, several of the naval shipyards conducted eye protection - eye correction programs and furnished to many employees, free of charge, prescription ground safety goggles. The results obtained from conducting the programs impressed the fact upon the Navy and industry that protecting good eyes and bringing defective eyes as near to normal as possible with corrective lenses, was good business and paid dividends. The original Navy eye protection - eye correction program was emphasized from 1943 through the summer of 1945, and then an impasse developed. Since that time, employees in the various shore establishments have realized the importance of eye protection and correction, and have, of their own accord, purchased prescription goggles to fit their eyes. The net result has been a reduction, or, at

least we have been holding the line, in the frequency of industrial eye injuries. However, in some cases improper eye protective devices were selected; some of the methods of enforcing the wearing of goggles, both plano and corrective, were ill-advised and aroused the opposition of workers against wearing goggles.

Some of the principal objections that have been raised by employees to wearing protective eye equipment are: "they do not feel comfortable"; "I can't see through them"; "they make me look funny." Such replies indicate that there is room for improvement in our employee relationships involving selling the workers on the necessity and wisdom of wearing goggles. Most of the objections can be removed by properly fitting the goggles and by providing accessible cleaning and repair stations.

Normal Vision an Aid to Protection

Too often the eye protection problems in a plant are considered settled if each employee is furnished with the proper type of plano safety goggles. A worker's subnormal vision may be the cause for inefficiency in his work and may be a monetary loss to the plant because the optimum type of protection has not been made available. The Navy is aware of this fact and is taking steps to provide for its employees the proper type of eye protection, and a type that will improve the vision of the workers; but first, we must survey our plants and remove the physical eye hazards by properly guarding the exposures.

Eyes are so extremely technical and present so many variables that we have come to regard visual skills and aptitudes as a major problem in the adaptability of workers to their jobs, and in the prevention of accidents caused by uncorrected vision. Physicians and optometrists, in general, up to about seven years ago, did not know much more about eyes and industry than what was included in their surgical and refractive procedures for injured and uncorrected eyes. But during the war, when speed, production, and accuracy as well as reduction of eye injuries were of prime importance, knowledge of the various elements of visual performance and the relation to visual job demands was gained.

The Industrial Visual Institute of Purdue University originated a study of visual skills and it was found that the minimum tests

necessary should include a record of: (1) distance acuity, with and without correction; (2) near acuity, with and without correction; (3) muscle balance (coordination of both eyes); (4) stereopsis (depth perception); and (5) color appreciation.

Prior to this, the only eye test or vision test was given by means of the Snellen Chart. This was somewhat inaccurate as a person with one bad eye could memorize the chart and get by, but was subsequently inefficient in his work. In other cases, people were denied jobs when correction would have gained an efficient employee for a plant.

Eyes for the Job

To clarify somewhat the term, "eyes and jobs," let us reword the term and say "eyes for the job," and apply to man. As an example, we could refer to a crane operator. Unless he has normal vision, normal depth perception, and normal muscle balance, with or without correction, it would be possible for him to misunderstand a hand signal and cause a serious accident. An electrician should have color appreciation in addition to normal vision. In so many cases the color of insulation on wires means much. A lathe operator will have multiple work distances to contend with and, in addition, be required to read a micrometer. An ordinary bifocal lens on his eyes may be a hazard. If he needs eye correction, be sure he has the proper type goggle and one that will not cut his efficiency. Should he be required to wear corrective goggles, an extra flip-up lens attached to the goggles instead of ordinary bifocals may mean the difference between efficiency and inefficiency. Faulty depth perception may cause the operator of any machine to receive a serious injury.

Vision Screening in Industry

When industry became interested in vision programs, several manufacturers of optical equipment started research on ways and means of checking the visual capabilities of workers and applying the findings to the workers' jobs. The results of the research have provided for industry a comprehensive program whereby the workers of a plant can be checked with very little loss of time from work; their efficiency can be improved; and, above all, the worker

is protected against eye hazards. In addition, the program establishes a guide for selective placement and a permanent record of the worker's vision.

There are several types of instruments which have been developed for visual screening. Currently the Navy is using the Sight-Screener and the Ortho-Rater. These instruments are, primarily, precision testing instruments designed to check visual performance under near and distant conditions and thereby discover individuals who require eye attention. The end product of the two instruments accomplishes about the same goal. That is to say that both check the following:

1. Simultaneous binocular vision. (Ability to see with both eyes at the same time.)
2. Right-eye acuity. (Both eyes are kept open during the right and left eye acuity test.)
3. Left-eye acuity.
4. Binocular acuity. (Keenness or sharpness of vision.)
5. Stereopsis. (Depth perception—tri-dimensional.)
6. Vertical muscular balance. (Eye posture in vertical plane.)
7. Lateral muscular balance.
8. Color test where required.

In testing an individual by means of the instrument, the operator is able to record the visual capabilities of the person. The results are then interpreted to determine the need for further eye examination by either an ophthalmologist or an optometrist and the ability to perform specific tasks with eye comfort and safety. The analysis of the capabilities can then be transferred to a form to be used as a guide to safe personnel placement. The capabilities may then be checked against the vision requirements for the job. The requirements that have been established by research have been accepted by industry as an excellent guide.

The Navy Eye Program

For years it has been the practice of the Navy to furnish protective goggles of various types to the employees of the shore establishments engaged in work hazardous to the eyes; but the furnishing of satisfactory eye protection to workmen whose vision required

correction has been difficult, and a lack of uniformity has existed in handling this phase. However, the passage of Public Law 604 by the 79th Congress, authorizing the expenditure of Navy funds for the purchase of clothing, equipment, and other materials deemed appropriate for the prevention of accidents and for the maintenance of occupational health, should facilitate the eye protection phase of the accident prevention program.

During the past several months, the Navy Department has been investigating the feasibility of instituting a comprehensive eye correction-eye protection program based upon the experience gained from the studies conducted in 1943, 1944, and 1945 at several of the shore establishments, and the practices to be found in the leading industrial plants of this country. As a result, the Navy has adopted a policy of providing for employees engaged in occupations hazardous to the eyes, prescription-ground safety goggles, without cost to the employees.

The established policy directs that commanding officers of shore establishments shall designate trades and shops or portions of shops as "eye-hazardous" where experience indicates that such action is justified for the prevention of eye injuries to workmen. All workmen engaged in these trades or employed in the designated shops shall be required to wear approved goggles at all times when working. Other employees or visitors should be advised of the need of wearing protective equipment and should be furnished such equipment while in the eye-hazardous areas.

To determine the workmen whose normal vision is not adequate for the safe performance of their duties, it is recommended that all those in the trades and shops which have been designated as eye-hazardous shall have their vision checked by either the Ortho-Rater or the Sight-Screener, and those found to have inadequate vision shall be furnished and required to wear corrective-protective safety goggles. The cost of furnishing the goggles is legally chargeable to the activity's available funds.

Prior to issuance of the directive, the Navy took into consideration the many ramifications involved in placing into effect the eye correction-eye protection program, with the thought that when the activities are directed to implement the program it will experience very little difficulty. This has included negotiations for contract

prices of lenses, frames, rental on instruments used for sight screening, writing of specifications, and providing for procurement of goggles and disposal of same, should the worker resign or leave his job.

The directive provides for the furnishing of corrective-protective goggles, without cost, only to those engaged in eye-hazardous trades. Those not employed in eye-hazardous areas but who desire to avail themselves of the reduced prices and to purchase safety goggles may do so. Dress spectacles are not included.

It is suggested that when management begins the eye correction-eye protection program, the screening process should not be limited to those employed in the eye-hazardous areas, but should include all employees. Workers found to have defective vision and employed in areas not designated as eye-hazardous should be so advised and encouraged to avail themselves of professional eye care for the purpose of improving their vision.

The American Optical Company and Bausch and Lomb have contracts with the Navy Department which include the furnishing of certain services on the part of their companies. Each company has a large number of field representatives who will call on activities that have leased an instrument for sight-screening purposes, instruct designated personnel in the use of the instrument, and assist in a liaison capacity by establishing relations between the activities and members of the eye-care profession. This includes ophthalmologists, optometrists, and optical dispensers. To carry out the mission of the program requires the collective services of all.

Implementing the Navy Eye Program

The following procedures were suggested in implementing the program:

1. Ascertain which sight-screening instrument is to be used. Procure the instrument in accordance with Bureau directives and indoctrinate personnel in operation.

2. Ascertain if qualified professional eye-care services are available at the naval activity. If not, a representative of the commanding officer should be designated to contact members of the eye-care professions residing locally. It was suggested that all persons engaged in the eye-care professions be advised of the program and

given an invitation to participate. A panel of ophthalmologists and optometrists would then be set up.

3. Establish a minimum professional fee schedule with the members of the eye-care professions for the purpose of rendering professional services in connection with prescribing, procuring, and fitting corrective-protective spectacles, including subsequent rectifying, adjusting, and servicing of such spectacles.

4. Employees who are required to wear eye protection and who, in addition, need visual correction are furnished the names of members of the eye-care professions who have signified their willingness to participate and whose names appear on the panel.

5. These employees are furnished with a Navy standard corrective-protective prescription form which they take to the professional man of their choice. In addition, the employee is furnished with a "Sundry Purchase Order," Form No. 114, which will be used in billing the naval activity for professional services.

6. The completed prescription form, signed by the examiner, is either forwarded by him to his optical laboratory or, in case glasses are to be purchased by the Navy, the prescription forms are returned to the supply officer for purchase in conjunction with other similar prescriptions.

7. Completed spectacles are delivered to the refractionist responsible for the prescription (or to an optical dispenser if so directed by the refractionist). Upon notification that delivery has been made, the employee is instructed to report for fitting. (Under no circumstances should the spectacles be delivered direct to an employee or fitted by persons not acceptable to the prescribing doctor.)

8. Repairs and replacements are to be handled in a manner similar to that established for acquiring and applying new protective-corrective spectacles. Orders for lens replacements are to be accompanied by a signed prescription. Verification and fitting of repaired corrective spectacles are to be performed by the refractionist responsible for the prescription or by an optical dispenser.

9. The above procedure is based upon the existence of the following circumstances: (a) in nearly all communities where naval stations exist the services of an optometrist or an ophthalmologist will be available; (b) optometrists are equipped to give complete examinations, write the desired prescription (except in cases of pathology), take care of the fabricating of glasses, and the fitting, servicing, and rechecking of the finished spectacle; (c) some ophthalmologists are equipped to give the same services, but most

of them are not prepared to care for the purchasing, fabricating, dispensing, adjusting, and checking of the finished spectacle—in such cases it is necessary for the ophthalmologist to examine the employee, write the prescription, and then send the employee to a dispensing optician; (d) the optician cares for the purchasing of frames and lenses, their fabrication, fitting, adjusting, and the checking.

10. Negotiations with the optometrist or ophthalmologist for the establishment of a fee schedule should make it perfectly clear that he will probably be asked to furnish prescriptions for not only those persons to whom the government plans to furnish glasses free of charge, but for others from the shore establishment who may wish to obtain a pair of corrective-protective glasses for use in their work. It is desirable to have the practitioner agree to furnish such glasses to this latter group at the same prices being charged the Navy.

11. It should also be clearly understood that the arrangement does not include provision for dress glasses; any such procurement is a matter between the individual and a civilian practitioner.

12. The checking of glasses against the prescription can only be satisfactorily performed by the use of a Lensometer or a Vertometer. It is not felt advisable for station personnel, regardless of their ability to properly fit glasses, to attempt the checking of the prescription unless the station has one or the other of the above-named instruments.

13. It is recommended that employees who have lost the sight of one eye be considered as being engaged in eye-hazardous work, regardless of their occupation.

14. Where qualified professional eye-care service is not available at the local activity, sick leave may be granted to obtain such service locally in accordance with NCPI 105.4–3.

The program has been established and is, in general, functioning as explained above; however, in some localities a new approach had to be made for various reasons, a few of which are: (1) Some naval activities have no ophthalmologist or optometrist practicing in the vicinity; (2) a proper fee basis could not be established that was agreeable to all concerned; and (3) lack of interest by the local eye-care professions in the Navy program.

These conditions have been satisfied in several ways: (1) Part-time employment of the ophthalmologist or optometrist at the activity; (2) full-time employment of the Civil Service P-4 or P-5

ophthalmologist, or the Civil Service P-3 or P-4 optometrist; (3) and so far as possible, assigning a Navy Medical Service Corps optometrist to the activity where he can care for both the active duty service personnel and the civilian employees of the Navy.

In general, the program which has been in effect just a little over a year has proved its value and, with the passage of time, it should definitely lower the amount of ocular accidents and accomplish the purpose for which the program was created.

Social and Family Problems of Eye Patients*

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POINTS out the responsibility of the doctor and the medical social worker in bringing about the rehabilitation of the eye patient and in considering his social and family problems.

IT would be easy to consider the problems of eye patients as strikingly different from those of any other patients who have a condition which might impose limitations upon them or result in disabilities. However, social workers have come to understand that circumstances such as unemployment, poverty, and dependency may exist in connection with any illness, and that it is the way the person and his family react to these social factors which constitutes the "problem." It is important not to lose sight of the fact that the basic needs of any human being are the same, although the methods by which they are met do vary in individual instances. Therefore, although the problems we are to consider are those which patients with eye diseases must face, they are not confined exclusively to any one diagnostic group.

Eye Problems Increase in Middle Life

It would seem axiomatic that, confronted with the difficulties attendant upon failing eyesight and blindness, everyone would be concerned with the preservation of this all-important faculty, but human nature is such that one frequently does not cherish his natural gifts until he is in danger of losing them. The person of middle years who has thought little about his excellent vision reacts with intensity to an eye condition which may have serious

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consequences. The reaction usually stems from anxiety or fear, although his outward behavior may seem to give little evidence of his concern. One dictionary defines anxiety as "painful uneasiness of mind over an impending or anticipated ill," and in some persons this emotion may paralyze action or arouse negative behavior, just as in others it may stimulate them "to do something about it." They may deny the probable severity of the prognosis even though they know little or nothing about eye conditions; they may appear indifferent to explanations; or they may refuse treatment.

We have met many patients whose objections to entering a hospital were based on seemingly valid "social" reasons. One says he is unable to meet hospital expenses; another that absence from work would mean loss of his job; and a mother says there is no one to care for her children while she is away. Any of these can be real situations and the social worker usually can help the patient meet them, but often the patient still is unable to follow recommendations. This is because he does not recognize his own fear or, if he does, he cannot talk about it. The skillful social worker must be able to look beyond the spoken word to its inner meaning and help the patient to see that his insurmountable obstacles were camouflage for his feelings.

Fear of Loss of Independence

There are very complicated feelings surrounding self-sufficiency and dependency. In our culture, earning a living is closely tied to status and, while many people look forward to leisure in their advancing years, it is to a life of ease made possible by their own previous adequacy, not an enforced dependence on others. Vision is of paramount importance both in achieving a desirable state in later years and deriving satisfactions from it when one arrives there. The probability that one may face an insecure future, makes many an eye patient apprehensive and depressed, meeting his present problems with mounting panic, as the following history will illustrate:

Mr. G. was forty-nine years old, married, and had four children ranging in ages from fourteen and a half years to seventeen months. He had been employed as a bookbinder and was skillful as well as happy in his work. The eye condition which necessitated removal

of his left eye disturbed him primarily because of his belief that it damaged his appearance. He was helped to obtain a prosthesis, and he took up his old work with little difficulty. When a traumatic cataract appeared on the right eye he became very disturbed fearing, in his greatly impaired vision, the probability of becoming dependent. The family was a closely knit one with real affection, and Mrs. G. found work while her mother cared for the children during the patient's period of treatment. An operation was performed and the patient retained enough vision so that he was not considered legally blind.

The condition was thought by the doctor to be static although the prognosis was somewhat guarded. Reassurance was given Mr. G. but instead of regaining his usual good spirits he became seriously depressed. The social worker, helped by Mrs. G.'s interpretation, realized that the patient was more distressed by not being an adequate worker than by the actual loss of his sight. As he expressed it, he was no longer "a good man," and was a burden to his family. He accepted with interest the referral to a special placement agency and when, after some delays in which he relapsed into depression, he obtained a simpler job, he went to work with enthusiasm. The fact that the job was less interesting and did not pay as much as he had earned was secondary to the fact that he had regained his self-respect.

Frustration at Impaired Vision

In comparison with fear and anxiety, frustration may seem a minor emotion but it is one which is often the cause of much difficult behavior. Presbyopia will probably not consign any patient to a life of uselessness but irritability is engendered when one cannot see as easily or clearly as he could. Dependence on any mechanical aid whether it be reading glasses or crutches can really limit one's sphere of activity. No well-adjusted person will be thrown off balance by a pair of bifocals but the difficulty experienced by some patients in wearing them is often indicative of their problems in meeting other and greater changes which come with age.

"Social" Problems Sometimes Worse Than Eye Problems

Sometimes his family is one of the chief "problems" with which a patient has to contend. Here again feelings complicate the adjustments necessitated by patients' eye conditions. Normal family

conflicts are increased and intensified when special attention has to be given to one member, and the attitudes of the others in the family may range all the way from over-protection to outright rejection. The daughter of one older woman in the clinic was so overwhelmed by her responsibility for her mother whose eyesight was failing that she gave up her own outside activities to devote all of her time to the patient. Unable to bear such sacrificial attention, the mother in turn denied her disability and let her five-year-old granddaughter lead her about, with almost disastrous results to both of them.

Another patient, a man of sixty, was treated for a condition which, the doctor was certain, would respond well to treatment and would result in a minimal visual handicap. In spite of the good prognosis, the patient's wife used his illness and the temporary attention needed, to insist on this permanent care outside of the home. It was not his eye condition, nor his age, but her underlying desire to be rid of her husband which motivated her apparent solicitude for his treatment.

Even in those instances where there is real family affection and concern for the patient, older people, resenting their predicament and their increasing helplessness, are often hostile to those who share their problems. In such cases even the most thoughtfully made plans are usually unsuccessful.

The Physician and the Social Worker

These, then, are some of the problems which the social worker meets in dealing with patients who are approaching old age with potential or actual impairment of vision. The doctor sees the same patients and, along with the social worker, has a real responsibility to help change those attitudes which can have such a disastrous effect on their lives. These reactions are, I believe, frequently not recognized by doctors, since usually a good deal has to be known about a patient before it is possible to understand his behavior, and patients often find it difficult to talk freely with a busy clinic physician.

There is one method which I am glad to say is being used increasingly to further closer relationship, and that is the sharing by the doctor with the patient of what is happening to the patient's

eyes and why it is happening, and what he can look forward to. To be in the dark, figuratively as well as literally, adds to anxiety and makes all planning in respect to home or work adjustments seem futile. It is little short of unbelievable, the sources of strength which human beings are able to draw upon when faced with problems which they understand and when they are offered skilled support and encouragement. Recently a young woman patient who had been under observation at a clinic for potential heart disease, voiced her bitterness over the past years. "The trouble with doctors is that no one ever tells you anything. Then you always think it is worse than it is. I used to go home from the clinic wondering if I were going to die on the bus." Along with the superlative technical care we are giving patients, we owe them an explanation of their condition that they can really understand.

Rehabilitation

The crux of the new approach to rehabilitation seems to me to be the development of the patient's usefulness to its optimum. Nowhere is this more important than with the eye patient, and yet frequently the state of the other sensory organs are not taken into consideration. There may be other and less obvious handicaps which contribute much more to poor adjustment than actual deprivation of sight. To one whose vision is impaired, hearing is of primary importance and hearing disability is one of the common accompaniments of age. Feeling complements sight, but such conditions as arthritis make touch less sensitive. As a concomitant of conservation of vision for old age, we should be equally concerned with the care of all the other senses.

Medical social workers began by doing concrete services for patients such as obtaining prostheses and arranging for convalescent care, and then they spread their work out to mobilize the resources of the community to meet the needs of particular patients. With the added knowledge that patients' difficulties often arise from inner as well as outer pressures, social workers, through understanding and support, now attempt to help the patient recognize his problems and use his own strength to solve them. Social workers try to learn something of the past as well as the present history of their patients, not just because it may be inter-

esting material, but as a means of throwing light on their capacity for constructive adaptation to their situations.

For some time the social worker has talked about "individualizing the patient," as if she alone had the responsibility for doing so. Then there was much talk of the doctor dealing with "the patient as a person," and increasingly his training is stimulating him to be aware of the total picture. Certainly those physicians and social workers who really work together for the patient, toward the goal of sight conservation, should know that their understanding of him and what he faces must be mutual; and their planning must be closely integrated if his attitudes of humiliation, anxiety, and despair are to be replaced by feelings of adequacy, self-respect, and hope.

The Forum

THIS section is reserved for brief or informal papers, discussions, questions and answers, and occasional pertinent quotations from other publications. We offer to publish letters or excerpts of general interest, assuming no responsibility for the opinions expressed therein. Individual questions are turned over to consultants in the particular field. Every communication must contain the writer's name and address, but these are omitted on request.

A Program for Vision Screening of School Children in Illinois

The Illinois Society for the Prevention of Blindness launched a demonstration program in 1947, under the sponsorship of the Chicago Ophthalmological Society, to determine the effectiveness of the Massachusetts Vision Test for use in Illinois schools. The Society found this method of vision screening to be practical and effective. It found, however, that there was great need for coordination of optometric and medical eye care if Illinois school children in need of further eye attention were to be assured of good professional follow-up care.

With this in mind a joint committee, composed of two ophthalmologists and two optometrists, was appointed to review the work which the Illinois Society already had done, and to draft a school vision-screening program which would be acceptable to both ophthalmologists and optometrists. Members of this committee are Walter Stevenson, M.D., president-elect of the Illinois State Medical Society, J. R. Fitzgerald, M.D., secretary of the Chicago Ophthalmological Society, James Wahl, O.D., and Glenn Moore, O.D., president and secretary, respectively, of the Illinois Optometric Association. Mr. Frank Woods, president of the Board of Directors of the Illinois Society for the Prevention of Blindness, serves, without vote, as ex officio chairman of this committee.

Responsibilities of the Committee

The responsibilities of the committee were clearly defined by the Illinois Society for the Prevention of Blindness, and no member of this committee accepted without

full knowledge of his responsibilities. These responsibilities are:

1. To plan a school vision-screening program for use in Illinois schools which will be acceptable both to the ophthalmologists and to the optometrists.

2. To plan an effective means of getting all Illinois schools to adopt the vision-screening program in as short a time as possible.

3. To submit such plans for review by the key ophthalmological and optometric societies in Illinois.

4. To recommend the approved plan to the Board of Directors of the Illinois Society for the Prevention of Blindness for adoption and execution.

The committee was further

1. To draft a standard by which certain children would automatically be referred for medical attention by the optometrist.

2. To plan a simple request for information, which form could be completed by both the ophthalmologists and the optometrists, and which would be returned to this Society for review by the committee. A summary of the findings would be prepared and reported on to the ophthalmological and optometric societies.

Finally, the committee was

1. To be responsible for general supervision of the development of the program.

2. To be available for regular monthly meetings.

Every member of the committee was given full information about the work of the Illinois Society with the Massachusetts Vision Test, and the experiences which the Society was having in the field, so that every member was well informed before the committee met.

Recommendations of the Committee

The recommendations of the Illinois joint committee on school vision-screening programs to date are as follows:

1. The Massachussetts Vision Test is the method of choice for vision screening in Illinois elementary and high schools.

2. Screening should be done by properly qualified lay personnel. Ideally, it should be done by the teachers in the school, or it could be done by volunteers such as members of the Parent Teacher Association.

3. Screening should be conducted annually. Ideally it should be carried on at the beginning and end of the school year.

4. There shall be mandatory referrals by the optometrist to ophthalmologists if such consultation is reasonably available:

   a. If there is corrected visual acuity of less than 20/30 in either eye.

   b. If there is any obvious or questionable pathological alteration of the eye or its adnexa.

   It is further recommended that there may be such referral in

   a. Any case failing to measure up to 20/20 in either eye.

5. The ophthalmologist should send to the referring optometrist a complete report of his findings as well as refer the case back for whatever optometric service can be rendered.

6. The vision-screening technician shall screen all children wearing glasses with their glasses on. Any of these who fail the screening test shall not be given a notice to see their eye specialist. Instead it shall be the responsibility of the public health nurse to get in touch with the child's specialist, advise him of the screening result and find out if the specialist wishes the child to return for further attention at this time. If this is desirable, the child shall be given a note advising him or the parents that an appointment to see his eye specialist is in order. The notice should not read that the child has failed the school vision-screening program.

7. There shall be no report on children who pass the screening procedure.

8. Report to parents: "A limited visual survey made of ..... indicates the need for a complete eye examination. Please take care of this at once." Signature should be that of the school principal or similar constituted authority.

Report for eye specialist to complete shall carry the notation to parents:

"It is requested you return this card to the principal after your doctor has completed it."

Uncorrected Visual Acuity	Refracted	Corrected Visual Acuity
R.V._____	R._____	R.V._____
L.V._____	R._____	L.V._____
Medical attention is advised	Yes____	No____
Glasses prescribed	Yes____	No____ (Please check)
Are orthoptics recommended?	Yes____	No____

Remarks:

Name of child_____ Age____ Grade_____ Sex____

Doctor's Signature:_____

These recommendations were accepted by the Illinois Optometric Association at its 41st annual meeting in February, 1949, and by the Chicago Ophthalmological Society at its regular monthly meeting, February 21, 1949. The recommendations already have been approved by the Executive Council of the Illinois State Medical Society.

The Illinois Optometric Association has set up a certifying board to qualify those optometrists who are interested and willing to cooperate in this school vision-screening program. When this certified list of optometrists is available the Illinois Society for the Prevention of Blindness will maintain a referral list of both optometric and medical eye specialists. Until this joint list is available, the Illinois Society for the Prevention of Blindness offers no referral list.

The Illinois Society for the Prevention of Blindness is committed to an extensive program of establishing school vision screening

throughout Illinois schools. How rapidly this can be done is, of course, related directly to the additional funds which the Society can raise for this purpose. We are hopeful that we can do the job of establishing school vision-screening programs throughout Illinois, in a three to five year period. School authorities are interested, and the plans of the Society involve establishing the kind of vision screening which can become a regular part of the school program.

A very interesting program has already been set up in Peoria, the second largest city in Illinois. The Peoria school board has appointed an ophthalmologist and an optometrist to serve as a professional committee. This committee gives careful supervision and advice on the local screening program in Peoria schools. Bradley University, which is located in Peoria, furnishes the manpower through a group of carefully selected and well-trained practice teachers. These practice teachers were trained in the techniques of the Massachusetts Vision Test by the staff of the Illinois Society for the Prevention of Blindness and they were also given a series of lectures to provide sufficient background for this new work. Bradley University includes this work as a regular part of the students' course, and the students receive corresponding credit. The Illinois Society for the Prevention of Blindness will continue supervision of this program until it is well established, and the Society is enthusiastic about the splendid cooperation found in Peoria. It is expected that similar plans will be developed in other communities where teaching institutions such as Bradley are willing to participate.

DOROTHY GRAY

Executive Secretary
Illinois Society for the Prevention of Blindness, Chicago, Illinois

Note and Comment

Summer Courses.—Because of the great shortage of teachers and supervisors of the partially seeing, the following colleges and universities are offering summer courses for preparation in this field. Demonstration classes will not be available in all of the courses listed; candidates should get in touch with the person indicated, for full information.

Place	*Dates*	*For Information Apply to:*
Florida State University Tallahassee, Florida	June 16–July 23	Dr. R. L. Eyman, Dean, School of Education.
Illinois State Normal University Normal, Illinois	June 20–August 12	Dr. Rose E. Parker, Director, Division of Special Education.
Los Angeles State College Los Angeles, California	June 20–July 29	Director of Summer Session, 855 N. Vermont Ave.
Michigan State Normal College Ypsilanti, Michigan	June 20–July 29	Dr. F. E. Lord, Director, Horace H. Rackham School of Special Education.
San Francisco State College San Francisco, California	June 28–August 5	Dr. Leo F. Cain, Director, Special Education.
Teachers College Columbia University New York, N. Y.	July 5–August 12	Admissions Office.
Tulane University New Orleans, Louisiana	June 13–July 22	Director of Summer Session.
University of Hawaii Honolulu, T. H.	June 19–July 29	Director of Summer Session.
Wayne University Detroit, Michigan	June 27–August 6	Mr. John W. Tenny, General Adviser, Education of Handicapped Children, College of Education.

1950 Conference Plans.—The National Society for the Prevention of Blindness is making plans for a five-day conference to be held in Miami Beach, Florida, March 26–30, 1950. The conference will be held jointly with the Pan-American Association of Ophthalmology, and it is expected that both the medical and sociologic

aspects of prevention of blindness and sight conservation will be emphasized.

More than 500 representatives from 20 states, the District of Columbia, and 11 foreign countries attended the Society's recent Conference celebrating its fortieth anniversary, in New York City. Outstanding personalities in sight conservation participated. Most of the papers presented at the Conference will appear in the current and subsequent issues of THE SIGHT-SAVING REVIEW.

Warning on Fluorescent Light Tubes.—In the past few months a number of sharp warnings have been issued on the necessity for handling fluorescent light tubes with caution and disposing of them carefully. The danger in the tubes is the possibility of breakage in which the beryllium from the inside of the tube is released. Medical experience has indicated that exposure of any cut or opening in the skin to beryllium results in a condition which does not respond to healing, and cases have been known of the development of tumors from cuts caused by a broken fluorescent tube. Inhalation of beryllium also produces an inflammatory condition in the lungs. The latest word on this subject indicated that the use of beryllium in fluorescent tubes is being discontinued by the manufacturers. In the meantime, anyone who has to dispose of fluorescent tubes is advised to break them under water.

National Conference of Social Work.—The National Society will participate in the forthcoming meetings of the National Conference of Social Work, June 12–18, in Cleveland, Ohio. In addition to maintaining an exhibit and conference booth, one meeting will be conducted on the subject of "Joint Planning and Developing Programs for those with Impaired Vision."

Recommended Grays for Industry.—Four shades of gray for use in painting industrial machinery and equipment were recently recommended in a proposed standard for Gray Finishes for Industrial Apparatus and Equipment and circulated for comment and trial use. Although the standard does not recommend that gray necessarily be used, it does suggest that when industrial apparatus is painted gray the use of these standard shades will help in matching the shade desired and in providing better color har-

mony. The four standard grays are described according to number and Munsell notation since it is expected that for industrial use the exact identification will be desired. For the convenience of individuals, however, color chips have been prepared so that anyone interested can visualize what the color described will look like on his machines. These color chips can also be used in making a quick visual check or comparison of the colors. The four standard grays recommended are: light gray; medium light gray (or standard machine tool gray 7-B); medium dark gray; and dark gray.

Second Annual Course for Orthoptic Technicians.—The American Orthoptic Council and the Ophthalmological Study Council announce their second annual course for Orthoptic Technicians. The first part will be held June 25–August 27 at Nasson College, Sanford, Maine. The second part of the course consists of attendance in offices and clinics in different parts of the country where the candidates can learn the art and practice of orthoptics under the supervision of certified technicians.

The subjects covered in the first part are anatomy, physiology, optics, refraction, child growth and development, the learning process, the diagnosis and treatment of ocular deviations, the method of dealing with amblyopia, suppression, anomalous correspondence, accommodative and nonaccommodative strabismus, preoperative and postoperative treatment, and the relations and duties of the orthoptic technician toward the ophthalmologist and the patient.

For part I (the didactic portion occurring in Maine) the enrollment is not limited, but candidates must have acceptable character, health, ocular and previous experience references. While a college degree is not required, two or more years of college work with emphasis on psychology, teaching and the sciences, is helpful. Experience in nursing, medical technical or secretarial work, and teaching will lend weight to the application.

The taking of part 1 only (the nine weeks' didactic instruction), does not qualify a student to take the American Orthoptic Council examinations or to feel trained in the field of orthoptics. Those students who have taken part 1 and have done well are eligible for part 2.

Those wishing to enroll may send for an application blank to the American Orthoptic Council, 1605 22nd St., N.W., Washington 8, D. C.

Dark Streets Are Dangerous.—In spite of the fact that a third as many vehicles are operating at night as in daytime, according to studies just completed more accidents occur at night. This fact was disclosed by The Street and Traffic Safety Lighting Bureau, and is based on reports from 14 states covering 353,659 accidents for which light conditions were reported. The Bureau said its study shows dark hours 38 per cent safer than daylight in respect to *total number of accidents*, but 40 per cent more dangerous when *fatal accidents* are taken into account. This means you are much more likely to be killed in a night accident than in one that happens in daylight. Inadequate visibility due to insufficient light is the chief cause of the higher fatality rate at night. Lack of enough light makes it impossible for drivers and pedestrians to see fatal dangers in time to save themselves. City traffic is particularly dangerous at night as evidenced by the fact that two-thirds of urban fatal accidents occur after dark. The conclusion that poor visibility is the chief contributing factor in the high night fatality rate is based on the fact that reports from cities which have relighted their streets show reductions in night fatalities attributed to relighting, average 76 per cent, the Bureau disclosed.

A.M.A. Again Endorses Local Health Units.—Among the resolutions adopted during the meeting of the House of Delegates of the American Medical Association, in St. Louis last winter, was the following:

> RESOLVED, That the House of Delegates reaffirm its abiding interest in the necessity for the provision of full-time modern public health services at the local and community level, including sanitation and all the services usually considered essential for the preservation of the public health, and be it further
>
> RESOLVED, That the U.S. Public Health Service be commended for, and encouraged in, its efforts for the further development of local health units for these purposes, and be it finally

RESOLVED, That the Board of Trustees be commended for its efforts in furthering full-time local health units and urged to continue actively all proper procedures to the end that local public health service shall become adequate throughout the nation.

Preliminary Notice of the 16th International Congress of Ophthalmology.—The 16th International Congress of Ophthalmology will be held in London under the presidency of Sir Stewart Duke-Elder, from July 17 to 21, 1950. This is the first International Congress to be held for thirteen years; it is hoped that it will be as successful as the previous Congresses have been, and will serve the additional purpose of bringing together a generation of ophthalmologists from many countries who have never yet met each other. Any qualified medical practitioner may become a member of the Congress; others not so qualified who have rendered service to ophthalmology and who are approved by the International Council of Ophthalmology will be eligible to attend. The three official languages of the Congress are English, French, and Spanish; any language, however, may be used. The rôle of the sympathetic system in the genesis of vascular hypertension and its effect upon the eye, and the clinical and social aspects of heredity in ophthalmology will be the two main topics of discussion.

Those desirous of participating in the main discussions or reading communications on other ophthalmological subjects should communicate with Mr. Keith Lyle, International Congress of Ophthalmology, 45 Lincoln's Inn Field, London, W.C. 2. Scientific demonstrations will be arranged, and there will be scientific and industrial exhibitions. Contributions to all of these will be welcomed.

Diet and the Eyes.—The February, 1949 issue of the *Connecticut Health Bulletin* publishes an article on "Information on Bread and Flour Enrichment" which is of interest to everyone engaged in sight conservation work, since diet has a relation not only to general health but to eye health. It has been well established that lack of riboflavin in the diet has a bad effect on the eye and since bread forms the foundation of the diet of most individuals, the lack of vitamin B is significant. Ocular disorders such as photophobia,

visual fatigue and burning eyelids, as well as conjunctivitis and keratitis are manifested in individuals whose diets are deficient in vitamin B complex. The article, which is presented in question and answer form, points out the need for the use of enriched flour because it seems difficult to educate the public to like whole wheat bread in which the largest amount of vitamin content can be found. The only alternative, therefore, seems to be the enriching of white bread and the dark breads which contain from 90 to 60 per cent of white flour. The article points out that there is no additional cost to the consumer for enriched bread, nor is the flavor altered by the addition of the vitamins. Groups that have approved the enrichment program include many governmental and voluntary public health and medical agencies, as well as the national organizations of the baking and milling industries. So important is the need for enrichment considered, that 23 states, as well as Hawaii and Puerto Rico, have enacted bread and flour enrichment laws.

Gold Medal Award.—The Leslie Dana Gold Medal for 1948, awarded annually for outstanding achievement in the prevention of blindness and the conservation of vision, was presented onMarch 25 at a dinner in St. Louis to Lawrence T. Post, M.D., professor of clinical ophthalmology and head of the Department of Ophthalmology at Washington University Medical School, St. Louis. He was selected for this honor by the St. Louis Society for the Blind, through which the medal is offered by Mr. Leslie Dana of St. Louis. This important award in the field of public health is given upon the recommendation of the Association for Research in Ophthalmology.

Wise Owl Club of America.—Membership in the Wise Owl Club of America, sponsored nationally by the National Society, is increasing at a rapid rate. This incentive program for eye safety has captured the interest of industry in general. In 21 states 48 companies, with 77 plants and a total employee enrollment of 106,174, have organized local chapters of the Wise Owl Club. Not only does the club give special recognition to employees who cooperate by the conscientious wearing of goggles but it is proving to be a real stimulus toward improvement in the general safety program. Since last January, we have enrolled 459 industrial employees

whose vision has been saved because they were wearing proper protection when an accident occurred.

Convention of the International Council for Exceptional Children.—The 25th annual convention of the International Council for Exceptional Children was held in San Francisco, California, from February 27, 1949 to March 3, 1949. The Council is composed of educators and social workers interested in the problems of handicapped children. NSPB was represented by its associate director, Mrs. Winifred Hathaway.

Used Eyeglasses Collected.—An organization called "New Eyes for the Needy, Inc.," sponsored by the Short Hills Junior Service League, is carrying on the work of the late Mrs. Arthur E. Terry in collecting eyeglasses of every description which can be readjusted for use by those who cannot afford to purchase new glasses. The method of operation is simple. The packages are opened and the contents carefully sorted by experienced volunteer helpers. The usable frames are sent to opticians; the old age or magnifying glasses go to the Frontier Nursing Service in Kentucky; sun glasses to the American Foundation for the Blind, and last, but not least, the metal frames and old gold scrap are sent to a large refining company in Newark, New Jersey, to be melted and redeemed for cash. This creates the fund which is used to pay the oculist's fee, and for the new lenses of the best material to be fitted to the frames.

A.M.A. Pointers for Better Vision of Television.—The following suggestions should help television fans see programs more easily and prevent eye fatigue, according to a recent *Journal* of the American Medical Association, in answer to a query:

1. In general, a large screen is considered better than a small one, because it allows clearer vision at a greater distance and gives a larger visual angle.

2. A distance of 10 feet or more away from the screen would, in general, be better than a shorter distance, provided the size of the screen and of the room would permit.

3. The nearer perpendicularly the screen is viewed, the better. Too much of an angle produces distortion and makes coordination of the two images received by the eyes difficult.

4. Although there is not a definite time limit for watching television, some discretion should be used, and it should not be persisted in beyond the point of fatigue.

5. Daylight screens, in general, are considered better than the ordinary ones because they are compatible with more light in the room, thus reducing the contrast between screen and surrounding objects.

Although television in itself does not produce eyestrain, it requires all the important "components of the visual act," and patients often complain of fatigue after relatively short periods, the *Journal* said. People with eye defects are especially likely to notice fatigue.

Current Articles of Interest

Pediatric Ophthalmology, Melvin W. McGehee, M.D., *The West Virginia Medical Journal,* January, 1949, published monthly by the West Virginia State Medical Association, 302 Atlas Building, Charleston, West Virginia.

Pediatric ophthalmology deals with the eyes of children. The pediatrician, ophthalmologist, general practitioner, and obstetrician, who see these members of the youngest generation, are seeing the future eyes of America and, therefore, have the responsibility of giving them the best possible advice and therapy.

Children show symptoms of eye trouble by lid squeezing when looking at objects, tripping over small objects, blinking and rubbing the eyes frequently, lacking interest in familiar distant objects, showing inability to distinguish colors, and exhibiting irritability and nervousness. There may be edema of the lids, a history of recurrent styes, tearing, crossing of the eyes, or headaches or nausea following use of the eyes.

Dr. McGehee indicates that the commonest affection in young eyes is conjunctivitis (an inflammation of the mucous membrane which lines the inner surface of the eyelid and is reflected over the fore part of the eyeball), followed closely by blepharitis, "granulated lids," which is a lid margin inflammation. He discusses crossed eyes as the most neglected cases in ophthalmology and urges early treatment as well as education of teachers, parents, and doctors.

The author recommends that "eyewash" drugs such as yellow oxide of mercury, boric acid, and silver proteins be dispensed with, since they are ineffectual home remedies, having no place in the treatment of children's eyes. Good vision can be preserved by competent care and treatment by the pediatrician and his colleague, the eye physician.

Eye Health of College Students, Charles E. Stanford, M.D., *The Journal-Lancet,* December, 1948, published monthly by Lancet Publishing Company, 514 Essex Building, 84 South Tenth Street, Minneapolis 2, Minnesota.

This author feels that it is fortunate that no visual acuity requirements for college exist as they do for the armed services, since students with widely varying visual acuity can take the same courses and do good work. In this connection, Dr. Stanford warns parents, refractionists, and others against overemphasis of "bad eyes" or instilling the idea of visual handicap in early childhood, since college students imbued with this notion encounter difficulty in adjusting to their studies. Dr. Stanford believes that a preconceived idea of visual handicap presents the most significant problem in caring for students' eye needs and indicates the importance of prevention of blindness by education of the public to a better understanding of what constitutes healthy, usable eyes.

The Effect of Certain Illuminants on Scores Made on Pseudo-isochromatic Tests, Lieutenant Dean Farnsworth, H(S), USNR and J. D. Reed, PhM. 1c, USNR, C.W. Shilling, Commander, (MC), USN, MO-in-C, Color Vision Report No. 4, November 22, 1943, reissued December 1, 1948, Medical Research Laboratory, U.S. Naval Submarine Base, New London, Connecticut.

In the preface to this reissue, the authors state that since the publication of the study in 1943 the conclusions have been further substantiated by continued work; and that it is now accepted that diagnoses made with pseudo-isochromatic plates are invalid unless the plates are administered under the illuminant for which they were designed.

The following summary is provided:

"The selection of pseudo-isochromatic plates and the interpretation of the scores have been decided from studies made under standard illuminants. However, color tests in the Navy are administered under a wide variety of lighting conditions. The color temperature of a number of these illuminants was measured, and two test lights were selected which represented diverse parts of the color-illuminant range: one, yellowish incandescent light, the other, standard mixed daylight. An abridged set of A.O. Plates was given to a test group under these two lights.

"Results:

"Variations in 'natural' daylight were sufficient to account for large differences in the error scores of deuteranomalous observers.

"Change from mixed daylight to yellowish incandescent light reduced the total error scores of the deuteranomalous observers by more than half.

"Approximately half of the deuteranomalous observers in the test group passed the same test under yellowish illumination which they failed under standard white.

"Lesser to no change was found in the protanomalous scores made under the two illuminants.

"Conclusions:

"Present acceptance-rejection standards are invalid when pseudo-isochromatic plates are administered under nonstandard illumination.

"The administration of the plates under yellowish light—natural or incandescent—tends to cause rejection of protanomalous and acceptance of deuteranomalous applicants.

"Recommendations:

"Psuedo-isochromatic plates should be furnished for testing in conjunction with a standard daylight lamp unit."

Ocular Changes Associated with Scrub Typhus, A Study of Four Hundred and Fifty-one Patients, Harold G. Scheie, M.D., *Archives of Ophthalmology*, September, 1948, published monthly by American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

Scrub typhus or mite bite fever is an acute febrile illness caused by the organism *Rickettsia nipponica*. It is endemic in China, India, Burma, the Federated Malay States, Indo-China, Japan, Netherland East Indies, New Guinea, the Solomon Islands, and North Queensland. Dr. Scheie summarizes the ocular changes associated with this disease as follows:

"The eyes of 451 patients with scrub typhus were studied weekly for evidence of disease. The following external changes were seen: (1) conjunctival injection, 38 per cent; (2) subconjunctival hemorrhages, 6.4 per cent; (3) ecchymosis [letting out of blood into the subcutaneous tissues] of the eyelids, 1.0 per cent; (4) eschar [a slough] on the eyelid, 0.5 per cent; (5) fixation nystagmus [jerky, incoordinate movements of the eyeballs from side to side when the patient tried to fix on an object], 0.5 per cent.

"The following ocular changes were seen: (1) engorgement of veins, 67 per cent; (2) retinal edema, 36 per cent; (3) retinal hemorrhages, 6.6 per cent; (4) exudates, 4.9 per cent; (5) uveitis, 1.3 per cent; (6) vitreous opacities, 4.6 per cent.

"Pathologic studies of eyes obtained at autopsy revealed that a subacute diffuse choroiditis was the basic lesion. Since changes in the fundus of this type had not been seen in other febrile diseases in this area, their presence was frequently helpful in diagnosis.

"Since its disappearance presumably occurs at about the time of recovery from other parenchymal lesions of scrub typhus, it was used as a criterion for the stage of convalescence."

Louverall Lighting Techniques, Benjamin S. Benson, Jr., *Illuminating Engineering*, February, 1949, published monthly by the Illuminating Engineering Society, 51 Madison Avenue, New York 10, New York.

In a discussion of louverall lighting techniques, the author presents the results of tests on louverall ceilings, a new lighting technique. He lists four basic considerations in louverall lighting installations which bear directly on the quality of illumination obtained and user satisfaction: adequate shielding; high system efficiency; pleasing appearance; and minimum direct and reflected glare. In such places as schools and offices, the 45° shielding angle has been generally accepted as providing good protection for the eyes in the potential direct glare zone. Louverall ceilings should have identical lengthwise and crosswise shielding. It has been shown that even though lengthwise brightness is lower than crosswise brightness, it is not sufficiently low so as to require less shielding. The provision of equal crosswise and lengthwise shielding allows lamps to be placed in either direction without violating the recommended shielding angle.

An experimental room was set up to test louverall installations using various louver materials. Tests showed that although system efficiency of translucent louvers was 16 per cent greater than the aluminum louvers, maximum brightness of translucent louvers at 45 degrees was only 87 per cent that of aluminum louvers. As the degree of shielding increases, the efficiency of the system decreases sharply. Pleasing appearance results from two separate lighting

patterns on the louver system itself. The first pattern is that caused in the individual louver cells by the cut-offs, transmissions, and interreflections in the louver vanes. The second pattern is that caused by variation in integrated brightness of individual cells over any given section of louverall ceiling. The author discusses brightness, indicating that with higher levels of illumination higher brightnesses than 1000 foot-lamberts can be used in the vertical to 45° zone and that increasing this brightness to 1800 foot-lamberts at 116 foot-candles compares favorably with the recommended maximum zonal brightness limits for classroom luminaires weighed against the I.E.S. *Lighting Handbook* recommendations for classroom illumination levels.

An extensive bibliography is included.

Filariasis, Harold W. Brown, M.D., *The American Journal of Nursing*, February, 1949, published monthly by The American Journal of Nursing Company, 404 North Wesley Avenue, Mount Morris, Illinois.

As defined by the author, filariasis is a general term for infection with any one of six filariae. The white, thread-like worms vary in length from 2 to 25 inches. Adult female worms give birth to embryos called microfilariae found in the circulating blood or tissues. The parasites are transmitted by biting insects, and usually are found in sub-tropical or tropical countries.

Of the various filariae, two are of particular interest: *Onchocerca volvulus*, found in Guatemala, Mexico, and Africa, transmitted by the black fly, common in temperate areas of the United States, frequently causes blindness, when the microfilariae migrate into the eye; *Loa loa*, found only in Africa, transmitted by the mango fly, has the annoying habit of migrating across man's eye just beneath the bulbar conjunctiva, and because of this is called the eye worm.

Concern has been heightened regarding this rather uncommon disease since the exposure of our troops to filarial infection and the entrance of infected persons into the United States from Caribbean countries. The author states, however, that in so far as is known, these persons have not caused additional cases of filariasis in this country.

"The following ocular changes were seen: (1) engorgement of veins, 67 per cent; (2) retinal edema, 36 per cent; (3) retinal hemorrhages, 6.6 per cent; (4) exudates, 4.9 per cent; (5) uveitis, 1.3 per cent; (6) vitreous opacities, 4.6 per cent.

"Pathologic studies of eyes obtained at autopsy revealed that a subacute diffuse choroiditis was the basic lesion. Since changes in the fundus of this type had not been seen in other febrile diseases in this area, their presence was frequently helpful in diagnosis.

"Since its disappearance presumably occurs at about the time of recovery from other parenchymal lesions of scrub typhus, it was used as a criterion for the stage of convalescence."

Louverall Lighting Techniques, Benjamin S. Benson, Jr., *Illuminating Engineering*, February, 1949, published monthly by the Illuminating Engineering Society, 51 Madison Avenue, New York 10, New York.

In a discussion of louverall lighting techniques, the author presents the results of tests on louverall ceilings, a new lighting technique. He lists four basic considerations in louverall lighting installations which bear directly on the quality of illumination obtained and user satisfaction: adequate shielding; high system efficiency; pleasing appearance; and minimum direct and reflected glare. In such places as schools and offices, the 45° shielding angle has been generally accepted as providing good protection for the eyes in the potential direct glare zone. Louverall ceilings should have identical lengthwise and crosswise shielding. It has been shown that even though lengthwise brightness is lower than crosswise brightness, it is not sufficiently low so as to require less shielding. The provision of equal crosswise and lengthwise shielding allows lamps to be placed in either direction without violating the recommended shielding angle.

An experimental room was set up to test louverall installations using various louver materials. Tests showed that although system efficiency of translucent louvers was 16 per cent greater than the aluminum louvers, maximum brightness of translucent louvers at 45 degrees was only 87 per cent that of aluminum louvers. As the degree of shielding increases, the efficiency of the system decreases sharply. Pleasing appearance results from two separate lighting

patterns on the louver system itself. The first pattern is that caused in the individual louver cells by the cut-offs, transmissions, and interreflections in the louver vanes. The second pattern is that caused by variation in integrated brightness of individual cells over any given section of louverall ceiling. The author discusses brightness, indicating that with higher levels of illumination higher brightnesses than 1000 foot-lamberts can be used in the vertical to 45° zone and that increasing this brightness to 1800 foot-lamberts at 116 foot-candles compares favorably with the recommended maximum zonal brightness limits for classroom luminaires weighed against the I.E.S. *Lighting Handbook* recommendations for classroom illumination levels.

An extensive bibliography is included.

Filariasis, Harold W. Brown, M.D., *The American Journal of Nursing*, February, 1949, published monthly by The American Journal of Nursing Company, 404 North Wesley Avenue, Mount Morris, Illinois.

As defined by the author, filariasis is a general term for infection with any one of six filariae. The white, thread-like worms vary in length from 2 to 25 inches. Adult female worms give birth to embryos called microfilariae found in the circulating blood or tissues. The parasites are transmitted by biting insects, and usually are found in sub-tropical or tropical countries.

Of the various filariae, two are of particular interest: *Onchocerca volvulus*, found in Guatemala, Mexico, and Africa, transmitted by the black fly, common in temperate areas of the United States, frequently causes blindness, when the microfilariae migrate into the eye; *Loa loa*, found only in Africa, transmitted by the mango fly, has the annoying habit of migrating across man's eye just beneath the bulbar conjunctiva, and because of this is called the eye worm.

Concern has been heightened regarding this rather uncommon disease since the exposure of our troops to filarial infection and the entrance of infected persons into the United States from Caribbean countries. The author states, however, that in so far as is known, these persons have not caused additional cases of filariasis in this country.

Myasthenia Gravis: Brief Notes Regarding Diagnosis and Treatment, Frank B. Walsh, M.D., *The Canadian Medical Association Journal,* January, 1949, published monthly by The Canadian Medical Association, 3640 University Street, Montreal, Canada.

In myasthenia gravis ocular signs are often the earliest symptoms, usually remaining predominant throughout its course. This disease, the origin of which is obscure, is characterized by abnormal exhaustibility of the voluntary muscles. Factors concerning the diagnosis of this disease are based on the author's observations of 125 cases, 57 per cent of which occurred in females, 43 per cent in males, and 18 per cent in negroes.

Dr. Walsh lists the following conclusions:

"1. The pathogenesis of myasthenia gravis remains obscure.

"2. A knowledge of the ocular signs is a necessary prerequisite to correct diagnosis in this disease.

"3. Concerning the ocular signs the following principle of diagnosis is offered: in cases characterized by external ophthalmoplegia if a diagnosis other than myasthenia gravis is not crystal clear a diagnostic injection of neostigmine is indicated. Atropine should never be omitted.

"4. Response to neostigmine is variable and requires experienced observation in some cases. A positive response, if it is pronounced and reproducible, almost certainly indicates the diagnosis of myasthenia gravis. In rare instances the individual with myasthenia gravis may be essentially neostigmine-resistant. . .

"5. A response to neostigmine may be obtained in non-myasthenics: bulbar palsy, amyotrophic lateral sclerosis, muscular dystrophy (Viets), congenital ptosis (Walsh), but such responses are weak and, at least in the condition last named, are not reproducible.

"6. A possible relationship between myasthenia gravis and hyperthyroidism may ultimately be elucidated.

"7. The treatment of ocular symptoms with neostigmine except in occasional instances is unsatisfactory.

"8. As regards thymectomy it is established that the operation has real value in some cases.

"9. Indications for thymectomy are unclear and urgently require further study."

Reading Disabilities and the Ophthalmologist, Ralph O. Rychener, M.D., Jean Robinson, A.B., *Transactions* American Academy of Ophthalmology and Otolaryngology, November–December, published bimonthly by the Douglas Printing Company, 109 North 18th Street, Omaha 2, Nebraska.

The authors review the literature on the subject of reading disabilities and provide the following summary:

"The personal experience of one ophthalmologist with 225 cases of reading disability has been reviewed.

"The ophthalmograph in the hands of a sympathetic and interested examiner has been found to be very valuable in establishing a diagnosis and estimating the degree of reading disability.

"Remedial reading has yielded excellent improvements in those children who have the advantage of sympathetic and understanding help from parents and teacher. Expensive equipment such as the metronoscope is not essential in treatment.

"The elementary teaching of phonetics and the kinesthetic method of spelling are, next to motivation or the will to learn, the most important factors in remedial reading training.

"A form letter outlining a method of therapy, which has been found valuable in saving the time and energy of the ophthalmologist, is included.

"The term 'word blindness' should be discarded as a synonym for reading disability."

Treatment of Bilateral Retinoblastoma by Irradiation and Surgery, Algernon B. Reese, M.D., George R. Merriam, Jr., M.D., and Hayes E. Martin, M.D., *American Journal of Ophthalmology,* February, 1949, published monthly by the Ophthalmic Publishing Company, 664 North Michigan Avenue, Chicago 11, Illinois.

Presenting a report on bilateral retinoblastoma (tumor), from the Institute of Ophthalmology in New York, the authors provide the following summary:

"The results of 15 years of treatment of bilateral retinoblastoma by the combined method of surgery and irradiation are presented. Fifty-five such patients . . . have been treated by this method, of whom 53 are available for statistical analysis—two having been eliminated for the reasons given. Of the total series 25, or 47.2 per

cent, are living, with vision of 20/200 or better; 16, or 30.2 per cent, are living without vision; and 12, or 22.6 per cent, have died of retinoblastoma. In the group followed 5 years or more there is a total of 19 persons. Of these, 6, or 31.6 per cent, are living, with vision of 20/200 or better; 6, or 31.6 per cent, are living, without recurrence but are blind; and 7, or 36.8 per cent, have died of the disease.

"The early recognition of the tumor in the second eye and its importance in the therapy is discussed. The clinical course of the tumor following radiation and the complications attendant thereto are described. The technique of therapy and the method of follow-up are presented."

Visual Correctibility of Naval Recruits, Everett J. Olenick, Commander (MC) U.S.N., *United States Naval Medical Bulletin,* February, 1949, published bimonthly by the Division of Publications Bureau of Medicine and Surgery, United States Government Printing Office, Washington, D. C.

The author provides a summary which is quoted in part:

"1. Evaluating the correctibility of subnormal vision at recruiting stations is a challenging problem in the solution of which no procedure can replace a careful and inquisitive physical examination performed personally by the recruiting medical officer.

"Used as herein described, the ophthalmoscope can be of considerable benefit toward reaching an accurate determination.

"2. If the prospective recruit can be improved beyond 13/20 with the ophthalmoscope, it is highly probable that he can be corrected to 20/20 by cycloplegic refraction.

"3. If the applicant cannot be improved to at least 13/20 by the pinhole disk or by ophthalmoscopic refraction, no statements of civilian practitioners concerning full correctibility merit credence. In such cases the Navy's interests would best be served if enlistment were withheld until each such prospective recruit should have proved his correctibility by securing suitable glasses with which he might actually be tested.

"4. Where simple methods fail to benefit deficient acuity readily, recruiting medical officers should bear in mind the possible presence of disqualifying permanent and uncorrectible visual defects,

notably amblyopia ex anopsia, and especially so when marked subnormality is present in only a single eye."

The Rôle of the Shahan Thermophore in Ophthalmic Therapeutics, M. Hayward Post, M.D., *American Journal of Ophthalmology,* February, 1949, published monthly by the Ophthalmic Publishing Company, 664 North Michigan Avenue, Chicago 11, Illinois.

Dr. Post discusses the uses of the Shahan thermophore, an instrument designed to place the local applications of heat to the various lesions of the eye upon a more scientific basis. The instrument was invented in 1916, at which time much enthusiasm was exhibited over its use. Later, for various reasons such as the occurrence of failures and mechanical inaccuracies, it became almost completely neglected. Dr. Post indicates that these mechanical obstacles have now been overcome and that study of this valuable instrument should be resumed. The author's summary follows:

"The Shahan thermophore is an instrument of immense value in ocular therapy, when properly used, and should be thoroughly understood by every well-informed ophthalmologist.

"By means of this instrument, the first scientific study of the effects of varying degrees of heat upon the ocular tissues, and upon a number of bacteria and viruses invading them, has been made possible.

"Temperatures up to 145° F., applied for one minute, do no permanent injury to normal ocular tissues, nor do they result in persistent clouding of the cornea.

"Temperatures of 158° F. to 160° F. do result in permanent changes in the substantia propria of the cornea, but such temperatures are only necessary in the most severe types of lesions, such as those resulting from the action of the tubercle bacillus.

"During treatment, the applicator should never be lifted, but should be in firm and constant contact with the lesion throughout the entire time indicated.

"The applicator should be of sufficient size to cover the entire lesion at one time, or should be applied with slightly overlapping edges a sufficient number of times to accomplish this result.

"The reactions should be thoroughly understood to avoid alarm

and to enable the operator to judge correctly as to when further applications are, or are not, desirable.

"Malignant growths should be treated with circumspection, and the greatest effort should be used to eliminate the initial lesion thoroughly at the first application."

The Stabilization of the Refraction and its Rôle in the Formation of Ametropia, A. Kettesy, M.D., *The British Journal of Ophthalmology*, January, 1949, published monthly by the British Journal of Ophthalmology, Ltd., 24, Thayer Street, London, W.1.

This author describes the formation of the refraction as involving two optical factors—refractive power and axis—which change as long as their anatomical substrata are in the process of growth. When both factors reach a standstill, the refraction is stabilized. The final refraction of the eye is determined by the following: the combination of the inherited optical elements; the process of stabilization, inherited independently of the optical elements; and the correlation between the first two factors. Dr. Kettesy attributes to every eye on the basis of stabilization a "biological value" independent of its refraction and, accordingly, classifies all eyes into three groups: those of reduced biological value (stabilization takes place before the complete perfection of the refraction); those of full biological value (stabilization occurs together with the harmonic perfection of the eye); and those of surpassed biological value (stabilization is late, the eye overgrows its harmonic measures).

Summarizing, Dr. Kettesy states that stabilization is the cessation of growth of the eye; the cause of the higher degrees of myopia is interpreted as retarded stabilization; detailed knowledge of stabilization will permit foretelling the future of an early myopia; and near work does not affect the development of individual myopia.

Book Review

LES GREFFES DE LA CORNEE (Keratoplasties). L. Paufique, G. P. Sourdille, Guy Offret. Paris: Masson & Cie, Editeurs, 1948.

This comprehensive study on keratoplasty was made by the above-mentioned doctors and presented to the French Society of Ophthalmology on May 23, 1948. This 300-page report contains a bibliography of over 600 references and is well illustrated with a few color plates and over 150 drawings.

The report is divided into a number of sections. The first part deals with the history of keratoplasty and traces the steps in the development of the modern surgical technique. This chapter, though not a complete historical résumé, makes the reader realize that there is nothing which had not been thought of a good many years previously. The use of a trephine for cutting a round window and the square window technique had been thought of before modern times, in fact as early as 1839.

The second chapter deals with the perforating types of keratoplasty. Indications, technique, and complications are discussed. Under the heading of complications, each of ten complications which might arise are discussed in some detail. Also late complications, that is, those which might occur one month or later, are enumerated and their treatment discussed.

A number of paragraphs are devoted to therapeutic keratoplasty, about which little is known in this country. Another portion of a chapter is devoted to comparing the results of optical iridectomy with keratoplasty, and the fact is demonstrated that the visual improvement from optical iridectomy is rarely ever satisfactory to the patient.

One whole chapter is devoted to keratectomies, their indications and contraindications, and a comparison made between keratectomy and lamella transplantation. The fifth chapter deals with the biology, physiology, and pathology of the graft. Chapter six discusses the results of, and makes comparisons between, the partial perforating and partial nonpenetrating types of corneal transplantation.

One is somewhat disappointed by the lack of case material in discussing the results of keratoplasty. This is probably because the results are largely the report of one individual. These reports, however, are excellent and compare favorably with what has been found out in this country. I think the authors are to be highly commended on a very excellent and fair summary of this subject.

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